DOCUMENT RESUME

ED 380 927 EC 303 801

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TITLE	The HyperSign Project.
INSTITUTION	New York City Board of Education, Brooklyn, N.Y.
PUB DATE	Mar 95
NOTE	33p.; Paper presented at the Florida Assistive Technology Impact and the Technology and Media Division of the Council for Exceptional Children Annual Conference (4th, Orlando, FL, March 2-4, 1995).
PUB TYPE	Speeches/Conference Papers (150) -- Reports - Descriptive (141)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Computer Assisted Instruction; *Deafness; Demonstration Programs; Educational Technology; Elementary Secondary Education; *Hypermedia; Independent Study; Inservice Teacher Education; *Instructional Development; Interactive Video; *Literacy Education; *Optical Disks; *Sign Language
IDENTIFIERS	HyperSign Immersion Project NY; New York City Board of Education

ABSTRACT

This report describes ongoing activities and results of the HyperSign Immersion Project developed at the Public School for the Deaf in New York City, New York. The project's objectives were to: (1) provide a means to enable Deaf students to assume a self-directed role in education; (2) provide an on-site prototype of a technologically supportive environment for the improvement of basic literacy and math skills in Deaf students; and (3) train teachers to use these new tools to develop sign language-supported modules in their own subject areas, choosing their own means, vision, and style to create lessons. The project produced an interactive compact disc (CD) called streetsigns which included 650 signs for use on a school-based computer system. The signs are organized into 24 categories of sign vocabulary based on metaphors of city life, such as subway, restaurant, police station, and library. The signs can be easily incorporated into teacher-authored and student-authored projects. The "StreetSigns" CD works smoothly with word processing, desktop publishing, database, presentation, authoring tools, and works programs. Teachers and students have developed several projects using the technology. A description of the contents of the "Street Signs" CD and techniques for navigating through the computer software are appended. (JDD)

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January 14, 1995

The HyperSign Project

Susan Abdulezer©1994

Report of the ongoing activities and results of the HyperSign Immersion Project developed at the Pubillic School for the Deaf in New York City.

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1.0 Comparison of proposed /planned performance vs. actual performance

In the original proposal 3 main objectives governed this project. These included:

1. To provide a means to enable Deaf students to assume a self-directed role in education.
2. To provide an on-site prototype of a technologically supportive environment for the improvement of basic literacy and math skills in Deaf students.
3. To train teachers to use these new tools to develop sign language supported modules in their own subject areas, choosing their own means, vision and style to create lessons.

The format of this section of the interim report follows those listed objectives with a description of associated activities and outcomes.

OBJECTIVE 1: TO PROVIDE A MEANS TO ENABLE DEAF STUDENTS TO ASSUME A SELF-DIRECTED ROLE IN EDUCATION

Establishing the Technical Environment.

Technology as a tool for self-direction is quickly becoming a learning norm at Junior High School 47. The increased presence of computers and the addition of many new technology users (both student and staff) has accelerated the transfer of skills needed to actively use computers to find information and develop ideas- textual, visual, and mathematical.

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HyperSign Browser.

In the spring term several HyperSign Browsers (look-up references containing 20 to 50 QuickTime Signclips) were incorporated into the computers residing in the English, Art, Enterprise, Deaf Culture and Library rooms. This was done in order to prepare the staff and students for the effective use of the HyperSign strategy.

In each case after a brief introduction the students used their browsers easily. This augmented their learning environment. In each subject area the students still used standard reading material (books, lists, handouts etc.) but could also use the Sign Browsers to look-up words or phrases in much the same way we use a dictionary or thesaurus...independently.

OBJECTIVE 2: TO PROVIDE AN ON-SITE PROTOTYPE OF A TECHNOLOGICALLY SUPPORTIVE ENVIRONMENT FOR THE IMPROVEMENT OF BASIC LITERACY AND MATH SKILLS IN DEAF STUDENTS.

Technical Activities

The basic technical goal of this project was to successfully produce an interactive CD which included hundreds of signs for use on the installed base of computers in a school setting. A special configuration of hardware and software was assembled over the course of the year with an eye on innovations which would enhance the success of the technical effort. The choice of a Hi-8 camera and Hi-8 VCR output device proved advantageous. The Hi-8 equipment was extremely sensitive to light which enabled me to video many different skin tones clearly. Because the initial clips were clear the subsequent digitizing process retained the images cleanly. This was essential to the respectful presentation of Sign Language.Since clarity and smoothness are difficult to achieve in digital form any aspect of the technology that can be optimized should be included.

Multimedia Authoring Activities

About 1,000 Sign Language videotapes were taken, digitized and stored on a gigabit drive. Of these about 750 were used. These were incorporated in a multimedia project using Apple Media Tool to program the underactivity and map out the relationship between the graphic elements. In my initial report I discussed researching various multimedia authoring tools, among them Macromind Director, HyperCard and Authorware. Using Apple Media Tool I could handle the large numbers of QuickTime movie clips and electronic illustrations (over 100 original graphics are included). Because AMT uses a graphical programming interface it supported rapid application development and avoided the need to depend on learning a special programming language (such as Lingo or HyperTalk.) The drawback was that it does not have a native search tool and does not support Apple Events in its current version. To incorporate one I would need to use the Apple Media Programming Environment or, as I have done, include a multimedia catalogue facility like Aldus Fetch.

Content Development and Interface Design

HyperSign Vocabulary

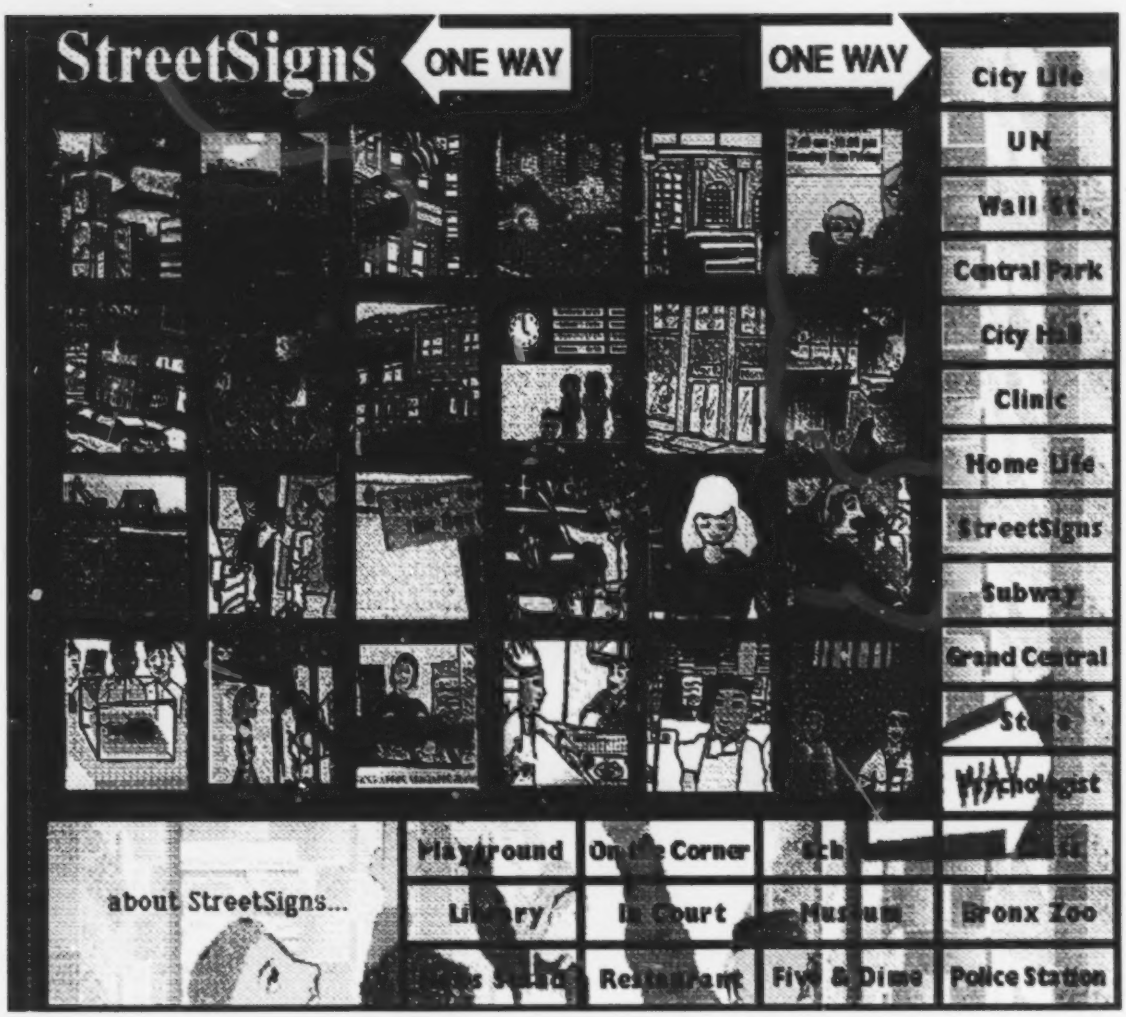
One of the initial considerations in developing "StreetSigns" was the determination of Sign language content. Test site teachers were canvassed for lists of appropriate vocabulary. The Deaf Staff members and interpreter who is a child of Deaf parents worked cooperatively throughout the year to review the accuracy of the Signs and their interpretations. Some on site research was also necessary to determine which Signs belonged in the "StreetSigns" category (colloquial signs).Ultimately the choice of the specific Sign vocabulary emerged from the language support needs of the students, determined with input from the teaching staff, paraprofessional support staff and student input. The Deaf Education Department at Hunter College also reviewed the language categories and the VU's (vocabulary units). In this process 24 categories of Sign vocabulary were chosen based on metaphors of city life. 1,000 VUs (Vocabulary Units) were videotaped.My initial focus was on generating a list of Signs rather than words, as there are many words which may be interpreted by a single sign.

An example: A Sign represented by a bent-five hand brushing upwards on the cheek may mean shy,ashamed or immoral. While describing similar aspects of personality these words have distinctly different meanings. While "shy" would not be a synonym of "immoral" they might both be interpreted by the same Sign. To represent this phenomena the term "signonym" was coined.To peg that Sign as meaning "shy" would eliminate its use in a different contextual climate. As literacy depends on an understanding of the deep meaning of a word within a sentence/paragraph/document then the Sign tool supporting literacy must accommodate the subtleties and distinctions of words in context.

I intended that in this CD-ROM individual words not be wedded to specific signs without presenting the breadth of concepts an individual sign covers.The technical strategy for providing this flexibility is to use the key word search facility as I develop the Signclips catalogue.

Visual Taxonomy

In preparation for compiling the Sign content, consideration was given to the manner of presentation. The intention was to create a metaphoric context for the word groups. Category groupings give clues to meaning and visual categories create visual clues...appropriate for learners dependent on this mode. Each category selected was depicted in a drawing supplied by my very talented students. They drew the category frames from their own experience-a very important consideration in determining the accessibility o the information to urban Deaf youth.The following is the final category map created from the students drawings:



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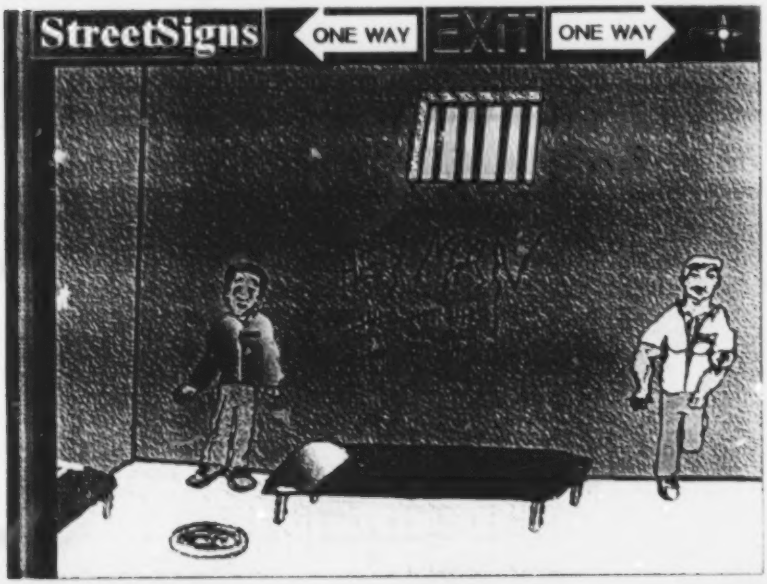
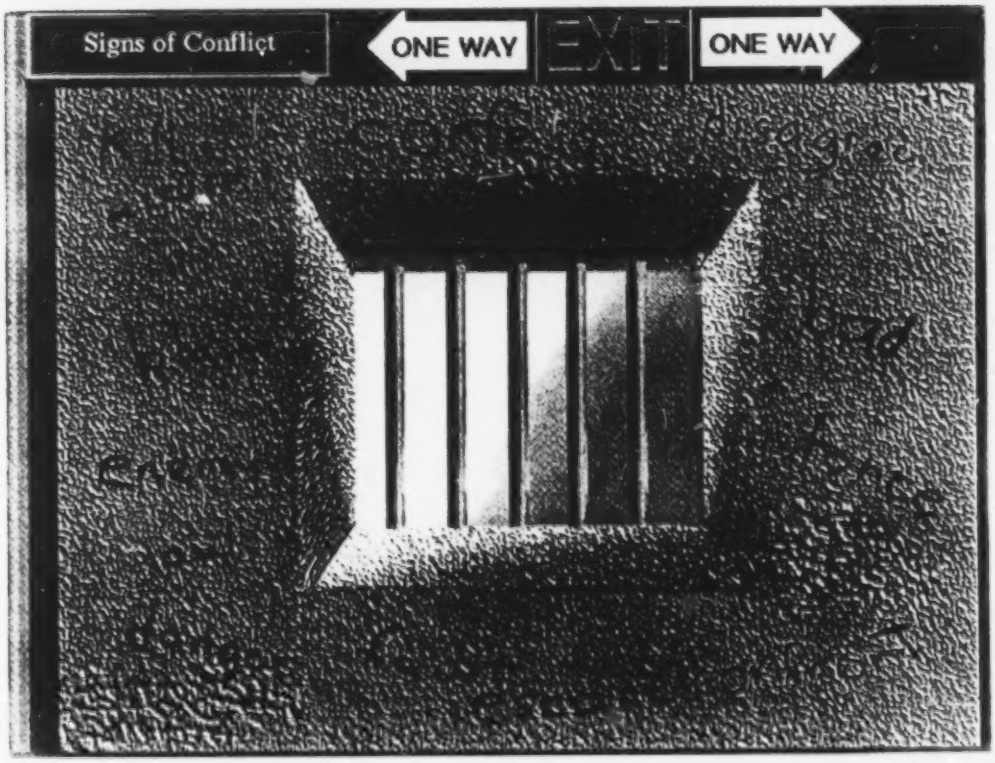
To extend their visual metaphor I designed companion illustrations with elements of the original drawings. These became the "Sign Walls". In this way the context complemented the meaning of the signs.The following illustrates the students original conception and the illustration derived from their world:

Another poignant example is the drawing a student made when given the category "Police Station" which would represent Signs of Conflict:





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OBJECTIVE 3:TO TRAIN TEACHERS TO USE THESE NEW TOOLS TO DEVELOP SIGNS LANGUAGE SUPPORTED MODULES IN THEIR OWN SUBJECT AREAS, CHOOSING THEIR OWN MEANS, VISION AND STYLE TO CREATE LESSONGS.

Technology access for school staff

In order to extend the access to technology as planned the Library multimedia and computer reference set-up was installed in the Spring. Two computers (an LC520 and a 660AV) laser printer and CD-ROM drivers are available to the entire school. In conjunction with the Librarian and skilled student tutors we held an open house to introduce the technology and advertise its availability.The librarian and I collaborated on a library Sign Browser containing the vocabulary of "Books and Information".Mary will be presenting her library program at a conference in November and I have been asked to produce video output of this browser as well as other HyperSign literacy projects. The equipment and lighting procured with fellowship funds have also been used to produce stories interpreted into American Sign Language which accompany books checked out by students.

CD-ROM use

"StreetSigns" is designed as a compact disk. In order to make teachers and students feel comfortable using this media as an information source the computers containing CD-ROM drives were made available in the library, to the bi-lingual classes, the art classes, the elementary and CRMD classes, science clusters and business skills classes. In this way the training needed to use digitized signs will be narrower, concentrating on creative use rather than button-pushing.

Digital Input of Graphics

In order to incorporate original graphics and custom photos the teachers were also trained in using scanning devices and QuickTake cameras (digital cameras) so that the students art work and photographs could be incorporated into the teacher and student made interactive lessons. Many teachers are rethinking their approaches to lessons in light of their new skills and the new capabilities of the technology.

Authoring Environments for the Classroom

Originally I determined that the fundamental interactive authoring environment designed to dovetail with the Signsource CD was Hypercard since all Macintoshes have Hypercard players (so the program does not need to be installed in each machine in order to run an interactive HyperCard lesson). However since I started this project many new and friendlier authoring environments have emerged.Two important ones are HyperStudio and Digital Chisel. I will have the opportunity to teach these software environments in the new multimedia training center I am setting up in JHS 47 in conjunction with the Technology Solutions office of District 75.

Progress of test site teachers

A small group of teachers were trained to use the multimedia authoring capability of the computers provided for classroom use by Apple Computer and Jose P. adaptive technology funds. Those projects have matured as teachers begin to think in terms of knowledge navigation in a sign supported multi-media environment. The following synopses describe their progress of these efforts.

The Deaf Culture staff scanned numerous photos and drawings depicting famous people in the area of Deaf Culture. They have also videotaped an expensive list of signs to be used with their interactive presentation. They began using HyperCard but this summer I trained them in HyperStudio which supports color.They were also consulted extensively on the accuracy of the Signs on the CD.

The English teacher, developed a year long project on "Romeo and Juliet" involving 22 Junior High School Deaf children. The students actively incorporated technology into their efforts by researching Elizabethan topics on CD-ROM, sketching, scanning and rendering electronic pictures, and referencing their Shakespearean SignBrowser to help them learn their lines.The students performed their play in May. The show was videotaped and that footage was used as source material in an interactive project using Signclips, graphics, sound, animation and special effects. The interactive project is called "Star-Crossed Studies" and was developed in HyperStudio.The students created some remarkable graphics on the computer which were incorporated into their software program.

The students also took advantage of the computer's capacity to capture single frames digitally by importing clips from the video taken of their production. They were able to capture a single frame and incorporate it into their software.

The art teacher, developed an interactive project on Picasso's painting "Guernica". She embedded the visuals and Signs illuminating the emotional, political and geographical elements of this painting. The interactivity branches from the image of the painting itself which was used as a visual plaiform to integrate History, Picasso's Legacy, Images of War, Techniques of Painting and Emotional Content. The juxtaposition of picture, video, word and animation illuminates the meaning of the painting. There is no text without appropriate illustrations and many of the words have embedded sign language movies to allow the students to access the concepts independently. The students also have an opportunity to manipulate the "hot spots", write their own views, and draw pictures in the style of Picasso.In the Spring I output this project onto videotape and entered it into a citywide multimedia contest. These students went on to a cooperative project where they helped to author their own interactivity.It was the first year projects

developed in special schools were permitted to compete with all the schools in the city on the same footing. The project won!

The librarian assisted in setting up a multimedia center in the library where interactive applications can be shared with the entire school. This multimedia center was set up in conjunction with a Library Power Grant which provided the funds to refurbish the library and to buy new books, software and CD-ROMs.It contains a 660AV and LC575 computer;built-in CD-ROM drives; a color scanner; and a laser printer.The librarian helped to develop a Library SignBrowser which we incorporated into both computers. An open house was held in the library, complete with student docents familiar with the technology and HyperSign browsers, ready to assist other students and teachers in the use of the computer, printer and scanner.This facility is available to the entire school population. Examples of the innovative use of technology in a library setting were presented at a National Library Conference in November 1993.

2.0 EVALUATION OF PROJECT PERFORMANCE

In my initial proposal I established 5 anticipated outcomes which would determine the success of the project.The format of this section of the final report follows those listed outcomes with a description of associated activities:

1."StreetSigns CD" will be successfully developed.

This project was pressed onto a CD in November 1994. It includes 1,206 graphic elements. Among them are over 650 signs incorporated into 87 interactive electronic screens.

2.The "HyperSign" modules will integrate with the CD ROM easily.

The basis for this project was the intention that the CD provide an efficient source for hundreds of signs which could be easily incorporated into teacher and student authored projects. In testing this a number of signs were imported into a variety of software programs which support QuickTime (the digital movie protocol). Microsoft Word 4.0, Framemaker,Filemaker Pro, Aldus Persuasion, Browser, HyperStudio, HyperCard 2.2, Digital Chisel and Clarisworks all worked smoothly with "StreetSigns".This list includes a word processing, desktop publishing, database, presentation, authoring tools and a works program that can combine graphics, movies, spreadsheets and paint programs to create original slide shows. With the first printing and dissemination of "StreetSigns" there will be more opportunities to test it in different settings and with different software packages. This follow-up should be the most exciting part of the project.

3.Teachers and students will succeed in developing HyperSign lessons.

As described in the narrative part of the statement of objectives there were several projects developed by teachers and students using the technology and approach suggested in the "HyperSign Project". Among them were:

- The "Guernica Project" involved sign supported text and graphics using HyperCard and ClarisWorks.
- "Star-Crossed Studies", a project involving an actual production of Romeo and Juliet in Sign Language, was developed in HyperStudio with graphics rendered in Photoshop.
- "Thank you, Ma'am", an interactive short story created in HyperStudio and HyperCard based on a piece by Langston Hughes.
- "I Have a Dream", an electronic book with embedded signs reflecting contextual meaning based on Martin Luther King's speech.
- "Patternseekers", an interactive exploration of patterns in nature developed in HyperStudio in a multilingual format (including Sign Language).

There are many other initiatives in this area as more teachers and students become skilled in the technology and are able to think in "mixed mode" presentation/exploration of ideas.

4.The skill needed to produce modules in other settings will be easily transferred.

"StreetSigns" was initially be sent to 11 sites throughout the United States to be used by teams of teachers, principals and university contacts. All of these sites have the technology to develop multimedia projects and, through telecommunications,Technical support is provided via telecommunications. These sites are schools with innovative programs that do not specifically target Deaf learners but want to incorporate Sign Language into their projects for student awareness and for inclusion.

There will also be a distribution of the CD to selected schools serving Deaf learners as well as Hunter College and Teachers College.

5. The "StreetSigns CD" will accommodate new technologies while maintaining a clear, intuitive interface.

The media elements on the CD are available for use in any program supporting the inclusion of QuickTime clips. As such it will work with any innovation as the technology evolves. The CD has already been used as a SignSource on a RISC machine (Propped) with success. Movie clips can also be opened by voice using the speech recognition set up in the newer computers. Newton technology is not ready for QuickTime clips, but I anticipate it will catch up. When it does there will be significant breakthroughs in portable translation devices for the Deaf.

3.0 Addendum

For a peek into how "StreetSigns" works click on the following icon to open the on-line documentation I have included on the "StreetSigns" CD.

1.Street Map Contents:

StreetSigns CD: A City Kid's Guide to American Sign Language

Street Map:

1. Street Map Contents
2. System Requirements
3. Introduction
4. Description of StreetSigns
5. Getting Started
6. Using the SignPost Navigator
7. Using the Category Screen
8. Using the Sign Language Screens
9. Other Navigation Tips
10. Using the Compass
11. Who can use StreetSigns
12. How to use StreetSigns for Sign Language Inclusion
13. Designing HyperSign Modules
14. Examples of HyperSign Projects
15. More Info

2.System Requirements:

To use StreetSigns you need a Macintosh Computer, the QuickTime extension, and 5 Mb of RAM to assigned to the StreetSigns application.

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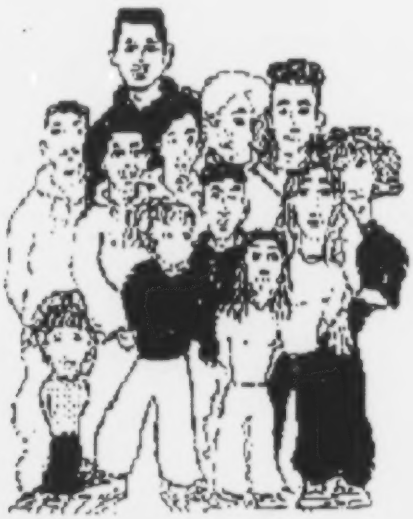
3.Introduction:

StreetSigns CD was developed in conjunction with the children of Junior High School 47, School for the Deaf, in New York City. The children contributed artwork, computer graphics, and their own unique take on urban life in New York.



The Signers featured in StreetSigns are all current or former students at the school. Elementary, Junior High School and Work Study students all participated.

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4.Description of StreetSigns:

StreetSigns is a Signsource. It contains over 650 signs which are divided into 24 language categories. Each category is represented by an urban metaphor. Signs of Math and Calculations are in the Wall Street section, while signs of Inquiry may be found at the Newsstand.

The students provided the original artwork for each category. This artwork is as important to the context of each sign as the category name because the drawings place each sign in a visual environment which gives strong clues to the sign meaning.

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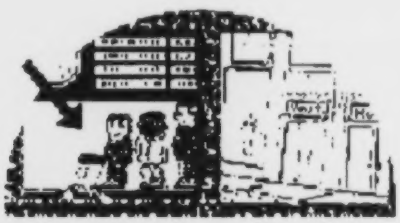
5.Getting Started:

To view StreetSigns just click on the StreetSigns icon. The program will automatically open up.

If you want to bypass the splashscreen and opening credits just click on the One Way sign. This will bring you to the StreetSigns category map.

The StreetSigns map is divided into 24 areas. Using the SignPost Navigator you can click on any picture or word to go to a language area.



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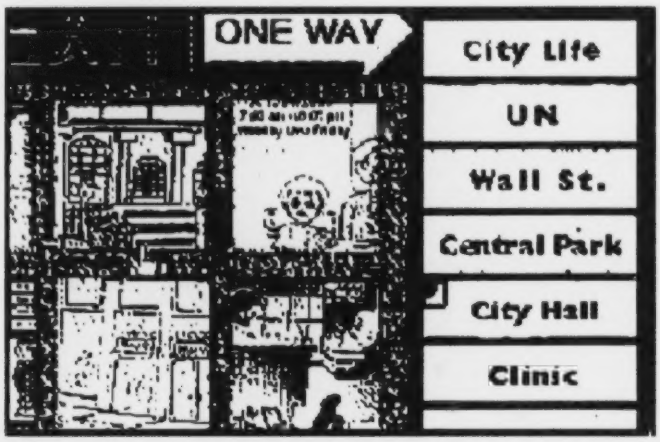
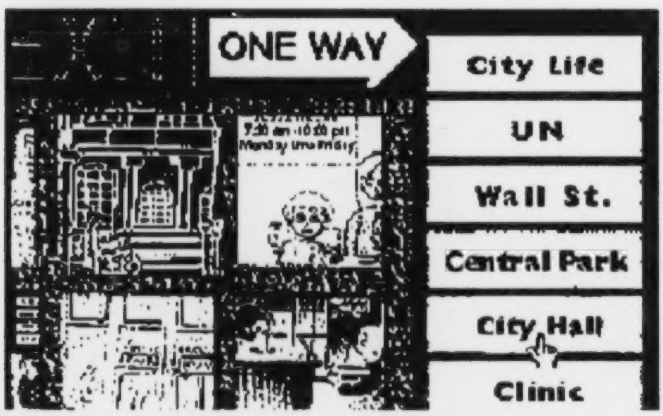
6.Using the SignPost Navigator:

You can navigate through StreetSigns easily using the SignPost Navigator. When you move the hand cursor over a picture on the main map you will see that the corresponding category word is highlighted by a little green dog ear.



When you move the hand cursor over a word,the picture is highlighted (it inverts). This way every picture is referenced by a word and every word is referenced by a picture.



Click on the word or the picture. This will bring you to the Category Screen for that language area.

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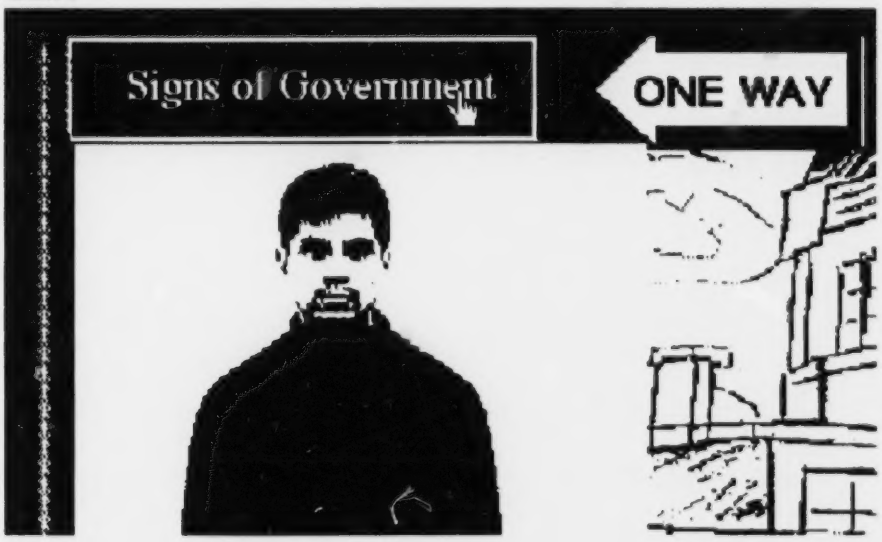
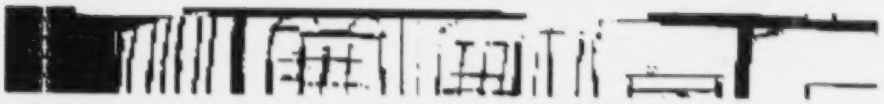
7.Using the Category Screen:

When you click on the word or picture of City Hall, for example, it will bring you to a screen that looks like this:

Bring the hand cursor over "STREETSIGNS". The sign will change into the language category you are about to explore. A picture of a student will appear. Click on the picture. He will sign the Category Topic (in this case Signs of Government). Click off to the side. He will disappear.





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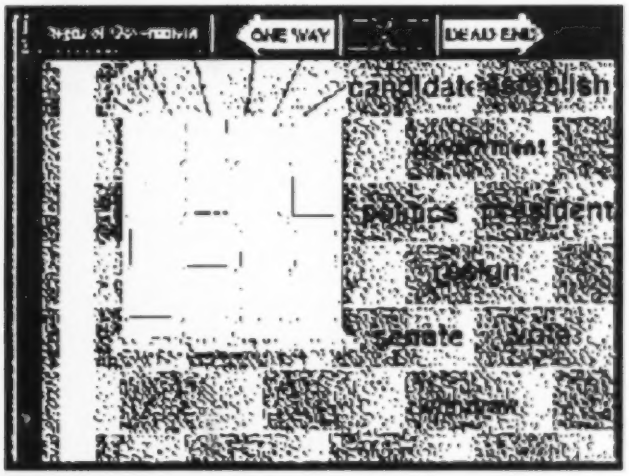
8.Using the Sign Language Screens:

Click on the ONE WAY sign pointing right.

This will bring you to the companion screen where you can view the signs when you click on a word.



If you click on the word politics you will see a videoclip of that sign:

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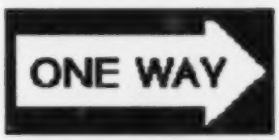
9.Other Navigation Tips:

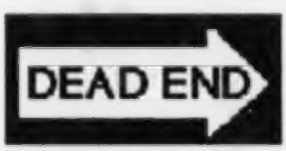
If you want to return to the previous screen, one level down, click on the ONE WAY sign pointing left:

If you want to see more signs in any category click on the ONE WAY sign pointing right:



If you want to go back to the Main Map click on the EXIT sign:

If you see the DEAD END sign it means there are no more signs in that category:



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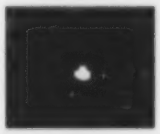
10.Using the Compass:

If you want to navigate to another category screen without going to the main map you can use the compass:



You will find the compass on the far right of each category screen.

The compass navigates according to the location of pictures on the main screen. If you are in Signs of Government and you want to go to another category using the compass your choices would be:

The Clinic is to the right, Central Park on the left, Department Store underneath, and if you click the compass pointer going North it will bring you around to the screen on the very bottom of the column: the Variety Store.

«End of chapter. Press the right arrow key to advance to the next chapter»

11.Who can use StreetSigns:

StreetSigns can be used by both children and adults to explore the world of Sign Language. It can also be used by teachers as a source of digital sign language.

All the signs in this CD can be used to enhance lessons created on a computer. In this way any text can have a HyperSign component allowing students more independence as they read.

HOME, SWEET, HOME

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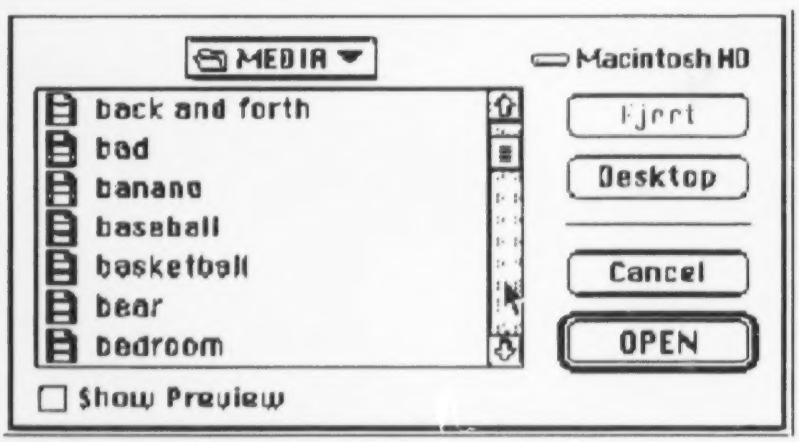
12.How to use StreetSigns for Sign Language Inclusion:

If you want to use the Signs on this CD to include in your lessons you need to use a program that plays QuickTime movies. Many presentation, word processing, and authoring programs can play digital movies. Check the program documentation to be sure.

Open up your program. Choose the command that inserts digital movies. Navigate through your system to find the Media folder that comes on the StreetSigns CD. Open it up. All the movies are contained in this folder. Find the movie by name and open it up into your program!



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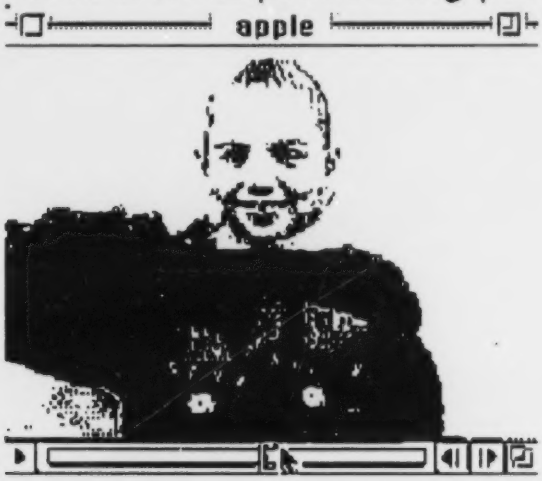
13.Designing HyperSign Modules:

Any picture or text can be enhanced by using Sign Language movie clips. You can play a movie with custom text underneath it in a word processing program.



PEEL ONE **RED APPLE** FOR THE PIE!

Or you can hide the signs inside the text or graphic so that when you click on a word or picture the Sign pops up.

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14.Examples of HyperSign Projects:

There are many uses for this signsource. It was developed to make multimedia a truly useful tool for creative access for Deaf Learners. It was also created to provide a lively source for Sign Language information.

Some example of the HyperSign environment include:

Star-Crossed Studies: An interactive project based on the Sign Language production of Romeo and Juliet.

The Guernica Project: A project combining text, pictures, Sign Language and animation exploring Picasso's painting.

"Thank you, M'am": An interactive project supporting Langston Hughes' idiomatic text with American Sign Language videoclips.

«End of chapter. Press the right arrow key to advance to the next chapter»

15.More Info:

If you would like more information about "StreetSigns" and the HyperSign environment you can write to:

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